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SUMMARY LETTER REPORT
RARITAN BAY SLAG
OLD BRIDGE AND SAYREVILLE, NEW JERSEY

CERCLIS ID No.: NJN000206276

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Prepared for:

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Introduction

The United States Environmental Protection Agency (EPA) has tasked Weston Solutions, Inc. (WESTON®) with an Integrated Assessment (IA) evaluation (with sampling) of the Raritan Bay Slag site ("the Site") (CERCLIS ID No. NJN000206276) in Old Bridge and Sayreville, New Jersey, to determine whether further action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is needed. From September 10 to 16, 2008, WESTON personnel collected surface and subsurface soil, sediment, and surface water samples from the Old Bridge Waterfront Park, Cheesequake Creek Inlet, and other nearby areas to determine if a removal action is warranted and for an evaluation of potential placement on the National Priorities List (NPL). This Summary Letter Report provides a description of the Site and the September 2008 sampling event.

Site Location

The Site is situated in a residential area on Raritan Bay in New Jersey and is bordered to the south, east, and west by residential properties and State Highway 35, and to the north by Raritan Bay. The site consists of a portion of Old Bridge Waterfront Park and the Cheesequake Creek Inlet, covering an approximate distance of 1.3 miles. The geographic coordinates of the approximate midpoint of the site are 40° 27' 30.0" North latitude and 74° 14' 45.0" West longitude. A Sample Location Map is presented in Appendix A, Figure 1.

Site Description

The Site is approximately 1.3 miles in length and consists of the waterfront area between Margaret's Creek and the area just beyond the western jetty at the Cheesequake Creek Inlet. The portion of the site located in Old Bridge is within the Laurence Harbor section and contains Old Bridge Waterfront Park. The park is made up of walking paths, a playground area, several public beaches, and three jetties, not including the jetties at the Cheesequake Creek Inlet. The park waterfront is protected by a seawall, which is partially constructed with pieces of slag while the western jetty at the Cheesequake Creek Inlet, and the adjoining waterfront area west of the jetty, contains slag as well. The slag was placed at the Site approximately 40 years ago. The seawall, jetties, and beach area east of the Cheesequake Creek Inlet, and the western jetty at the Cheesequake Creek Inlet are popular fishing areas. The beaches east of the Cheesequake Creek Inlet and west of the seawall appear to be the most popular for swimming.

The Margaret's Creek portion of the site was proposed to be purchased by the State of New Jersey Green Acres Program in 2006. During the preliminary assessment phase of the Green Acres review process, historical aerial photos revealed the filling of the site with an unknown material. On May 23 and July 24, 2007, the New Jersey Department of Environmental Protection (NJDEP) conducted surface soil sampling events along the southern shoreline of the Raritan Bay adjacent to the Old Bridge Waterfront Park. Analytical results from these sampling events indicated the presence of lead at concentrations as high as 142,000 milligrams per kilogram (mg/kg). NJDEP described the waste material associated with the seawall as consisting of refractory brick and large pieces of rust-colored slag. The slag was described as "low-yield metallic waste from blast furnace and blast furnace rubble" including finer grained "nuggets", as well as automobile battery casing fragments of various

sizes. The NJDEP report stated that it is possible that some of the finer waste materials comprising the seawall may have been included in the soil samples.

On April 24, 2008, EPA received a request from the NJDEP to evaluate the Laurence Harbor Seawall for CERCLA Removal Action consideration. On November 3, 2008, EPA received an amended request from the NJDEP to include the northern jetty (herein referred to as the western jetty) at the Cheesequake Creek Inlet in the overall scope.

Existing Analytical Data

On May 23, 2007, the NJDEP conducted a limited sampling event at the intersection of Margaret's Creek and Raritan Bay, along the seawall at the Old Bridge Waterfront Park, on the first two beaches located west of the seawall, and within the grassed portion of the park. The NJDEP collected a total of 37 surface soil samples for metals analysis only. Analysis indicated concentrations of lead that ranged from 8.1 mg/kg to 142,000 mg/kg; antimony (1.5 J [estimated] mg/kg to 12,900 mg/kg), arsenic (6.1 J mg/kg to 3,350 J mg/kg), and copper (16.6 J mg/kg to 709 J mg/kg) were also detected.

The NJDEP conducted a second sampling event on July 24, 2007 from the same general locations. NJDEP collected a total of 34 surface soil samples for metals analysis only. Analytical results indicated concentrations of lead that ranged from 3.1 J mg/kg to 545 J mg/kg; antimony (0.42 J mg/kg to 20.2 J mg/kg), arsenic (1.3 mg/kg to 24.5 mg/kg), and copper (1 J mg/kg to 39.7 mg/kg) were also detected.

Integrated Assessment (IA) Sampling Program

From September 10 through 16, 2008, WESTON personnel collected a total of 48 aqueous samples (including two environmental duplicate samples), 95 surface soil samples (including five environmental duplicate samples), 10 subsurface soil samples, and 84 sediment samples (including four environmental duplicate samples) from the Site.

The aqueous samples were collected adjacent to the seawall, between the western end of the seawall and the first jetty, between the third jetty and the eastern jetty at the Cheesequake Creek Inlet, within the Cheesequake Creek Inlet, west of the western jetty at the Cheesequake Creek Inlet, and from Margaret's Creek. The aqueous samples collected by WESTON were analyzed for Target Analyte List (TAL) metals and dissolved metals (excluding mercury, including tin) through the EPA Contract Laboratory Program (CLP).

The surface and subsurface soil samples were collected from throughout the Site, including the seawall, the western jetty at the Cheesequake Creek Inlet, as well as the beach, park, and playground areas. The soil samples were analyzed for TAL metals and Toxicity Characteristic Leaching Procedure (TCLP) metals through the EPA CLP.

The sediment samples were collected within Margaret's Creek, between Margaret's Creek and the western end of the seawall, between the third jetty and the eastern jetty at the Cheesequake Creek Inlet, within the Cheesequake Creek Inlet, and west of the western jetty at the Cheesequake Creek Inlet. Six of the sediment samples were collected approximately 0.5 mile east of Margaret's Creek as background samples. The sediment samples were analyzed for TAL metals through the EPA

CLP. Grain-size distribution analysis was conducted by a private, subcontracted laboratory. Site Figures and the Sampling Trip Report are presented in Appendices A and B, respectively.

Sample Analytical Results

Analytical results for soil samples indicated the presence of lead at extremely elevated levels on the western jetty of the Cheesequake Creek Inlet. Four surface (0-2 inches) soil samples ranged from 54,800 mg/kg to 198,000 mg/kg. The maximum concentrations of antimony, arsenic, and copper detected at the western jetty were 3,120 mg/kg; 2,470 mg/kg; and 4,630 mg/kg, respectively. Two subsurface (one at 6-12 inches and one at 12-18 inches) soil samples indicated the presence of lead at a maximum concentration of 731 mg/kg. The maximum concentrations detected in the subsurface soil samples for antimony, arsenic, and copper were non-detect, 15.4 J mg/kg, and 76.6 mg/kg, respectively.

Four surface soil samples collected from an area west of the western jetty of the Cheesequake Creek Inlet indicated the presence of lead; concentrations ranged from 231 mg/kg to 14,200 mg/kg. The maximum concentrations detected in surface soil samples for antimony, arsenic, and copper were 616 mg/kg, 198 J mg/kg, and 340 mg/kg, respectively. One subsurface (6-12 inches) soil sample from this area indicated the presence of lead at 21,500 mg/kg. The concentrations detected in the subsurface soil sample for antimony, arsenic, and copper were 419 mg/kg, 228 J mg/kg, and 489 mg/kg, respectively.

Six surface soil samples collected from the beach area along the seawall indicated the presence of lead; concentrations ranged from 44.8 J mg/kg to 1,600 J mg/kg. The maximum concentration detected for copper was 74.4 J mg/kg. All antimony and arsenic concentrations, which ranged from 6.1 R (rejected) mg/kg to 152 R mg/kg and 1.2 R mg/kg to 72.8 R mg/kg, respectively, were subsequently rejected as unusable during the data validation process due to quality control issues. Three subsurface (6-12 inches) soil samples indicated the presence of lead; concentrations ranged from 22.5 J mg/kg to 1,100 J mg/kg. The maximum concentration detected for copper was 51.4 J mg/kg. All antimony and arsenic concentrations, which ranged from 6.3 R mg/kg to 100 R mg/kg and 1.6 R mg/kg to 53.9 R mg/kg, respectively, were subsequently rejected as unusable during the validation process due to quality control issues. Five surface soil samples collected from an area between Margaret's Creek and the eastern end of the seawall indicated the presence of lead; concentrations ranged from 11.4 J mg/kg to 10,200 J mg/kg. The maximum concentrations detected for antimony, arsenic, and copper were 120 mg/kg, 48.3 mg/kg, and 186 J mg/kg, respectively.

Seventeen surface soil samples collected from the beach area between the western end of the seawall and the first jetty indicated the presence of lead; concentrations ranged from 57.9 J mg/kg to 1,630 J mg/kg. Four subsurface soil samples (two at 6-12 inches and two at 12-18 inches) ranged from 649 J mg/kg to 23,800 J mg/kg. The maximum concentrations detected for antimony, arsenic, and copper were 832 mg/kg, 602 mg/kg, and 704 mg/kg, respectively.

Ten surface soil samples collected from the beach area between the first and second jetty indicated the presence of lead; concentrations ranged from 109 J mg/kg to 935 J mg/kg. The maximum concentration detected for copper was 75.7 J mg/kg. All antimony and arsenic concentrations, which ranged from 3.6 R mg/kg to 15.4 R mg/kg and 4.5 R mg/kg to 37.5 R mg/kg, respectively, were subsequently rejected as unusable during the data validation process due to quality control issues.

Nineteen surface soil samples collected from the beach area between the third jetty and the eastern jetty of the Cheesequake Creek Inlet indicated the presence of lead; concentrations ranged from 1.7 J mg/kg to 94.1 J mg/kg. The maximum concentrations detected for antimony, arsenic, and copper were non-detect, 9.2 mg/kg, and 15 mg/kg, respectively.

Six soil samples collected from the beach area, parallel to the inlet, on the eastern side of the Cheesequake Creek Inlet, indicated the presence of lead; concentrations ranged from 1.8 mg/kg to 4.4 mg/kg. The six samples indicated non-detect values for antimony. All arsenic and copper concentrations, which ranged from 1.8 R mg/kg to 5.4 R mg/kg and 1.0 R mg/kg to 2.0 R mg/kg, respectively, were subsequently rejected as unusable during the data validation process due to quality control issues.

Twenty-four surface soil samples collected from the park and the playground area indicated the presence of lead; concentrations ranged from 8.9 J mg/kg to 97.8 J mg/kg. The maximum concentrations detected for antimony, arsenic, and copper were 0.42 J mg/kg, 144 mg/kg, and 131 J mg/kg, respectively.

Thirteen soil samples were analyzed using the TCLP. The Resource Conservation and Recovery Act (RCRA) limit for lead (5 milligrams per liter [mg/L]) was exceeded in 9 of the 13 samples. All five soil samples collected at the western jetty of the Cheesequake Creek Inlet, and west of the western jetty, exceeded this limit. The soil results for the western jetty exceeded the limit by a magnitude of approximately 100 to 250 times. The remaining exceedances were all from the seawall area.

Sediment samples collected west of the western jetty of the Cheesequake Creek Inlet indicated the presence of lead in nine samples; concentrations ranged from 29.6 mg/kg to 2,150 mg/kg; two samples with concentrations of 2,910 R mg/kg and 4,130 R mg/kg were subsequently rejected as unusable during the data validation process due to quality control issues. The maximum concentrations detected for antimony, arsenic, and copper were 53.7 J mg/kg, 62.9 J mg/kg, and 204 J mg/kg, respectively.

Both sediment samples collected from the Cheesequake Creek Inlet, close to the western jetty, which were identified to contain 42,200 R mg/kg and 89,200 R mg/kg of lead, were subsequently rejected as unusable during the data validation process due to quality control issues. It should be noted that the quality control issue was related to a low recovery on the matrix spike sample. The maximum concentrations detected for antimony, arsenic, and copper were 3,270 mg/kg; 2,100 J mg/kg; and 2,050 J mg/kg, respectively.

Twenty-one sediment samples collected from the beach area between the third jetty and the eastern jetty at the Cheesequake Creek Inlet indicated the presence of lead; concentrations ranged from 1.2 J mg/kg to 11.4 mg/kg. One sample indicated the presence of lead at 21.2 R mg/kg, but was subsequently rejected as unusable during the data validation process due to quality control issues. The maximum concentrations detected for antimony, arsenic, and copper were 0.86 J mg/kg, 3.7 mg/kg, and 11.0 J mg/kg, respectively.

Twelve sediment samples collected from the area between the western end of the seawall and the first jetty indicated the presence of lead; concentrations ranged from 200 mg/kg to 533 mg/kg. The

maximum concentrations detected for antimony, arsenic, and copper were 32.9 J mg/kg, 55.7 J mg/kg, and 46.7 J mg/kg, respectively.

Twenty-eight sediment samples collected from the western end of the seawall to Margaret's Creek indicated the presence of lead; concentrations ranged from 7.3 mg/kg to 5,860 mg/kg. The maximum concentrations detected for antimony, arsenic, and copper were 33.2 J mg/kg, 22.5 mg/kg, and 117 mg/kg, respectively. Samples that were identified to contain 232 R mg/kg of antimony, 157 R mg/kg of arsenic, and 248 R mg/kg of copper were subsequently rejected as unusable during the data validation process due to quality control issues.

All six sediment samples collected from the background location, which ranged in lead concentration from 3.2 R mg/kg to 9.3 R mg/kg, were rejected as unusable during the data validation process due to quality control issues. The maximum concentrations detected for antimony, arsenic, and copper were 1.1 J mg/kg, 10.6 J mg/kg, and 4.9 J mg/kg, respectively.

Four sediment samples collected from Margaret's Creek indicated the presence of lead; concentrations ranged from 23.8 J mg/kg to 279 J mg/kg. The maximum concentrations detected for antimony, arsenic, and copper were 2.1 J mg/kg, 16.1 J mg/kg, and 62.7 J mg/kg, respectively.

The grain size distribution results revealed that sediment samples collected from the area west of the western jetty at the Cheesequake Creek Inlet and Margaret's Creek on average contained a lower percentage of sand and gravel (72%) than sediment samples collected from the remainder of the Site (96.7%).

Analytical results for surface water samples indicated that the most elevated levels of lead were generally detected in areas closest to the slag. The surface water west of the western jetty of the Cheesequake Creek Inlet contained a maximum total lead concentration of 1,810 micrograms per liter (µg/L). Antimony, arsenic, and copper were detected at maximum total concentrations of 53.2 µg/L, 70.9, µg/L, and 154 µg/L, respectively. Three surface water samples collected from the Cheesequake Creek Inlet had a maximum total concentration of lead at 6.7 µg/L, and a maximum total concentration of arsenic at 4.8 J µg/L (antimony and copper were not detected). Three surface water samples collected from the beach area between the third jetty and the eastern jetty of the Cheesequake Creek Inlet contained a maximum total lead concentration of 99 J µg/L, and a maximum total concentration of arsenic and copper at 15.2 µg/L, and 23.9 µg/L (antimony was not detected). The maximum total lead concentration detected in the bay near the seawall was 153 µg/L. On the backside of the seawall, in a wetland near Margaret's Creek, lead was detected at a maximum total concentration of 298 µg/L. Three activity-based surface water samples collected from the beach area between the western end of the seawall and the first jetty had an average total lead concentration of 1,179 µg/L, with a maximum total lead concentration of 1,450 µg/L. Antimony, arsenic, and copper were detected at maximum total concentrations of 29 µg/L, 34.5 µg L, and 67.7 µg/L, respectively. Three surface water samples collected from Margaret's Creek indicated the presence of lead; total concentrations ranged from non-detect to 49.9 µg/L. Antimony, arsenic, and copper were detected at maximum total concentrations of 2.5 J µg/L, 21.6 µg/L, and 15.2 J µg/L, respectively. The reported values of the dissolved metals were generally similar to the total metals values for all of the water samples collected at the Site.

LIST OF APPENDICES